

CLAIMS

1. A biological chip comprising a substrate; and a probe as a biologic material or artificial biologic material immobilized on a surface of the substrate,

wherein the substrate is in the form of a column or cylinder, and

5 wherein the probe comprises one selected from the group consisting of nucleic acids, peptides, saccharides, lipids, cells, and fragments of these materials, and wherein the probe is immobilized on a circumferential side wall of the substrate.

2. The biological chip according to claim 1, further comprising an index mark indicating the position of the immobilized probe on the surface of the substrate.

10 3. The biological chip according to claim 2,

wherein the index mark comprises plural index marks,

wherein the probe comprises plural probes immobilized at plural positions in the substrate,

15 wherein the plural positions of the immobilized probes are separated into plural groups, and

wherein the index marks are so arranged at predetermined positions on the substrate as to distinguish one group from another.

4. The biological chip according to any one of claims 1 to 3, wherein the probe comprises plural probes and includes at least one internal standard probe.

20 5. A biological chip assemblage comprising stacked plural plies of the biological chip according to any one of claims 1 to 4,

wherein the biological chips are so stacked that the central axes of the columns or cylinders substantially coincide with each other.

25 6. The biological chip assemblage according to claim 5, wherein a spacer is arranged between adjacent two biological chips.

7. An incubator serving to bring a sample into contact with the biological chip according to any one of claims 1 to 4 or the biological chip assemblage according to one of

claims 5 and 6, the sample being reactive with at least one of the probes, to thereby carry out a reaction between the sample and the at least one of the probes,

wherein the incubator is so configured as to keep the central axis of the column(s) or cylinder(s) of the biological chip or biological chip assemblage being substantially horizontal and to rotate the biological chip or biological chip assemblage around the central axis, and

wherein the incubator is so configured as to immerse a vertically lower part of the biological chip or biological chip assemblage in a medium containing the sample.

8. An assay device for determining at least one of physical properties, chemical properties, and biological properties of a molecule bound to the probe on the biological chip according to any one of claims 1 to 4 or the biological chip assemblage according to one of claims 5 and 6,

wherein the assay device comprises a measuring section and is so configured as to rotate the measuring section along the circumferential side wall of the column(s) or cylinder(s) around the central axis of the column(s) or cylinder(s).

9. An assay device for determining at least one of physical properties, chemical properties, and biological properties of a molecule bound to the probe on the biological chip according to any one of claims 1 to 4 or the biological chip assemblage according to one of claims 5 and 6,

wherein the assay device is so configured as to carry out an assay while rotating the biological chip or biological chip assemblage around the central axis of the column(s) or cylinder(s).

10. The assay device according to one of claims 8 and 9, comprising a measuring section, and further comprising a mediator between the measuring section and the biological chip or biological chip assemblage.

11. A biological chip comprising:

a columnar or cylindrical substrate; and

plural containers arranged on the circumference of the substrate.

12. The biological chip according to claim 11, wherein the containers are detachably arranged on the substrate.

13. The biological chip according to one of claims 11 and 12, wherein the containers
5 contain assay reagents.

14. The biological chip according to claim 13, wherein the assay reagents are solid.

15. The biological chip according to one of claims 13 and 14, wherein the assay reagents are each a reagent which specifically reacts with a material to thereby determine the presence or absence of the material and to determine one of the quantity and activity of
10 the material, wherein the material is selected from the group consisting of genes, and molecules including GOT, GPT, LDH, CPK, ALP, gamma-glutamyl transpeptidase, LAP, BUN, CRE, Ch-E, Na, K, Cl, Ca, P, Fe, Mg, ammonia, sialic acid, blood sugar (BS), HbA1C (hemoglobin A(1C)), amylase, bilirubin, total protein, albumin, uric acid, cholesterol, neutral lipid, HDL cholesterol, LDL, CRP, digoxin, theophylline, valproic acid,
15 phenytoin, thyroid hormone, TSH, HBs (hepatitis B surface) antigen, HCV (hepatitis C virus) antibody, GH, LH, FSH, prolactin, ADH, ACTH, renin activity, aldosterone, myoglobin, ANP, BNP, erythropoietin, insulin, PSA, CEA, CA 19-9 (carbohydrate antigen), and AFP.

16. The biological chip according to claim 15, wherein at least one of the containers
20 contains plural assay reagents of different types.

17. The biological chip according to any one of claims 11 to 16, wherein the containers carry identifying marks on their outer surfaces for distinguishing one container from another.